Thuja occidentalis - Betula alleghaniensis Forest (White Cedar - Yellow Birch Forest)

COMMON NAME	White-cedar - Yellow Birch Forest
SYNONYM	White Cedar - Yellow Birch Forest
PHYSIOGNOMIC CLASS	Forest (I)
PHYSIOGNOMIC SUBCLASS	Mixed evergreen-deciduous forest (I.C)
PHYSIOGNOMIC GROUP	Mixed needle-leaved evergreen - cold-deciduous forest (I.C.3)
PHYSIOGNOMIC SUBGROUP	Natural/Semi-natural (I.C.3.N)
FORMATION	Mixed needle-leaved evergreen - cold-deciduous forest (I.C.3.N.a)
ALLIANCE	THUJA OCCIDENTALIS - BETULA ALLEGHANIENSIS FOREST ALLIANCE

CLASSIFICATION CONFIDENCE LEVEL 2

USFWS WETLAND SYSTEM TERRESTRIAL

RANGE

Voyageurs National Park

This type is most commonly found in the environs south and southwest of the park, but also occurs less commonly in the southern part of the park on flat terrain.

Globally

This community is found in northern Minnesota, northern Wisconsin, northern Michigan, and Ontario. It is reported from two ecoregion subsections in the western Lake Superior basin.

ENVIRONMENTAL DESCRIPTION

Voyageurs National Park

This type occurs on flat or gently sloping terrain with variable aspects. It frequently occupies toeslopes located just above wetland communities. There is usually very little surficial bedrock. Soils contain a shallow (1-5 cm) organic layer over 5-15 cm of loam or silt loam over dense lacustrine clay. In some cases, a shallow build up of well decomposed peat may be present. Microtopography is typically flat. Coarse woody debris is often abundant.

Globally

This community is found on both poorly drained lowland soils, occasionally bordering on wet, organic soils (Beals and Cottam 1960, Chambers *et al.* 1997), and gentle to somewhat steep northerly slopes (C. Reschke personal communication 1999). The soil is typically moderately acidic sandy clay with a thin litter layer.

MOST ABUNDANT SPECIES

Voyageurs National Park

Stratum	Species
Emergent tree	*Populus tremuloides, Populus balsamifera*
Tree canopy	*Thuja occidentalis, Abies balsamea*
Tall shrub	*Abies balsamea, Acer spicatum, Corylus cornuta*
Short shrub	*Rubus pubescens*
Forb	*Mitella nuda, Aralia nudicaulis*
Fern	*Lycopodium* spp.
Nonvascular	*Rhytidiadelphus triquetrus*

Globally

Stratum	Species
Tree canopy	*Thuja occidentalis, Betula alleghaniensis*
Short shrub	*Cornus canadensis*
Forb	*Clintonia borealis*

CHARACTERISTIC SPECIES

Voyageurs National Park

Thuja occidentalis, Populus tremuloides

Globally
Thuja occidentalis, Betula alleghaniensis

VEGETATION DESCRIPTION
Voyageurs National Park
This community is dominated by a canopy of *Thuja occidentalis* with lesser amounts of *Abies balsamea*. Canopy coverage is typically 80-100%. *Populus tremuloides* and/or *Populus balsamifera* can occur as an emergent strata with 30-60% cover or as part of the canopy of *Thuja occidentalis*. In stands with a dense canopy, the shrub layer is usually absent. In more open canopies, the shrub layer is present at low cover and consists of *Abies balsamea, Acer spicatum,* and/or *Corylus cornuta*. Cover of the herbaceous stratum is, likewise, dependent on canopy closure. Stands with dense canopy may virtually lack an herbaceous stratum. Even in more open stands, cover of the herbaceous layer is typically less than 40%. The most abundant species are *Rubus pubescens, Mitella nuda, Aralia nudicaulis, Lycopodium clavatum,* and *Lycopodium dendroideum*. The nonvascular strata may be absent or present at low cover. The most abundant species is *Rhytidiadelphus triquetrus*.

Globally
The canopy of this community is dominated by *Thuja occidentalis* and a variety of hardwoods, most typically *Betula alleghaniensis, Betula papyrifera*, and *Populus tremuloides*, but occasionally *Acer rubrum, Acer saccharum,* and *Fraxinus nigra*. Associated conifers include *Abies balsamea*, *Picea glauca*, and, rarely, *Tsuga canadensis*. The understory usually contains a well developed shrub/sapling layer, including *Abies balsamea*, *Acer spicatum, Corylus cornuta, Diervilla lonicera*, *Linnaea borealis*, *Ribes triste*, *Rubus pubescens*, and *Taxus canadensis.* Herbaceous species include *Aralia nudicaulis, Aster macrophyllus*, *Clintonia borealis, Coptis trifolia, Cornus canadensis, Dryopteris carthusiana, Galium triflorum, Gymnocarpium dryopteris, Lycopodium* spp., *Maianthemum canadense, Mitella nuda, Onoclea sensibilis,* and *Trientalis borealis*. Moss species include *Hylocomium splendens*, *Pleurozium schreberi, Rhytidiadelphus triquestrus*, and others (Minnesota NHP 1993, Chambers *et al.* 1997). Diagnostic features include the mixed dominance of *Thuja occidentalis* and hardwoods, particularly *Betula alleghaniensis,* in an essentially upland site type.

CONSERVATION RANK G2Q. There are probably fewer than 100 occurrences of this community rangewide. It is reported from Minnesota (where it is ranked S2), Wisconsin (S?), Michigan (S?), and Ontario (S?). Currently there is only one occurrence documented from Minnesota, but stands at Voyageurs have recently been reported. Minimal data on current acreage are available; the one occurrence documented from Minnesota has 14 acres. It is likely that many stands have been degraded by logging. This community is reported from two ecoregion subsections in the western Lake Superior basin.

DATABASE CODE CEGL002450

COMMENTS
Voyageurs National Park
Most stands are closely related to the White Cedar-Boreal Conifer Forest. Though uncommon, some stands that are more well drained may be more closely related to the mesic versions of the Spruce-Fir/Mountain Maple Forest. The understory of this community can resemble that of the White Cedar-Boreal Conifer Forest. The Eastern White Cedar-Yellow Birch Forest differs in having at least 25% *Populus tremuloides* and/or *Populus balsamifera* in the canopy or emergent strata.

Given the predominance of *Populus tremuloides* in the canopy and emergent layers of this community, stands of this type in the park may represent a disturbed (post-logging) phase of the Eastern White Cedar-Yellow Birch Forest.

REFERENCES
Beals, E., and G. Cottam. 1960. The forest vegetation of the Apostle Islands, Wisconsin. Ecology 41:743-751.
Chambers, B.A., B.J. Naylor, J. Nieppola, B. Merchant, P. Uhlig. Field Guide to Forest Ecosystems of Central Ontario. Southcentral Science Section (SCSS) Field Guide FG-01, Ontario Ministry of Natural Resources, North Bay, Ontario, Canada. 200 pp.
Minnesota Natural Heritage Program. 1993. Minnesota's native vegetation: A key to natural communities. Ver. 1.5. Minn. Dep. Nat. Resour., Nat. Heritage Prog. St. Paul, Minn. 110 p.